

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

RECEIVED
CENTRAL FAX CENTER

JAN 15 2008

REMARKS

This Amendment is responsive to the Office Action dated October 15, 2007. In this Amendment, Applicant has added claims 33 and 34. Support for the new claims may be found throughout Applicant's originally-filed application including, for example, FIG. 13, and paragraph [0119]. Claims 1-10, 21, and 23-34 are pending. In view of the above amendments and the following remarks, Applicant respectfully requests reconsideration and withdrawal of the rejections set forth in the Office Action.

Information Disclosure Statement

On December 1, 2006, Applicant filed a Supplemental IDS with a Request for Continued Examination. The Supplemental IDS was filed in order to submit a Declaration under 37 C.F.R. 1.132. The Declaration under 37 C.F.R. 1.132 presents information relating to the manufacture of medical device programmers more than one year prior to October 2, 2003. At this time, Applicant has not received any indication that the Declaration under 37 C.F.R. 1.132 has been considered. Applicant respectfully requests an indication that the Declaration under 37 C.F.R. 1.132 was considered.

Claim Rejection Under 35 U.S.C. § 103(a)

In the Office Action, claims 1-4 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nelson et al. (U.S. Patent No. 6,418,346, hereinafter "Nelson") in view of Maoz et al. (U.S. Patent Application Publication No. 2004/0125029, hereinafter "Maoz"). The Office Action also rejected claims 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 1 above, and further in view of Stein et al. (U.S. Patent Application Publication No. 2004/0230246, hereinafter "Stein"), claims 5-8, 23-29, and 32 under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 1 above, and further in view of Carbunaru et al. (U.S. Patent Application No. 2004/0098068, hereinafter "Carbunaru"), and claims 30 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz in view of Carbunaru as applied to claim 23 above, and further in view of Stein.

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

Applicant respectfully traverses the rejections. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

Claims 1-10 and 21

Independent Claim 1

With reference to independent claim 1, for example, the applied references fail to disclose or suggest a programmer for an implantable medical device that includes an internal antenna mounted on a first circuit board within a programmer housing and a display device mounted on a second circuit board within the programmer housing, where the first circuit board includes a substantially contiguous ground plane layer interrupted by a plurality of gaps.

In support of the rejection of claim 1, the Office Action stated that Nelson discloses a programmer for an implanted medical device with a telemetry antenna on an antenna driver circuit board and a display screen on a graphics circuit.¹ As the Office Action recognized, Nelson fails to disclose or suggest, among other things, an internal antenna, a first circuit board on which the internal antenna is mounted, a second circuit board on which a display device is mounted, and a substantially contiguous ground plane interrupted by a plurality of gaps, as required by claim 1.² The Office Action looked to Maoz to overcome the deficiencies in the Nelson reference. In particular, the Office Action asserted that Maoz discloses an internal antenna, a ground plane layer, a plurality of gaps, and a display on a separate circuit board.³ The Office Action reasoned that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the programmer of Nelson with an internal antenna and gaps on the circuit board that is separate from the display circuit as taught by Maoz, "since such a modification would provide the predictable result of a programmer with an internal antenna and a ground plane layer that is disrupted by gaps for providing increased power without internal noise."⁴

¹ Office Action at pp. 2-3, item 4.

² *Id.* at p. 3, item 4.

³ *Id.*

⁴ *Id.*

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

Applicant respectfully disagrees with the Office Action's conclusion that Nelson in view of Maoz renders claim 1 obvious. Nelson in view of Maoz fails to disclose each and every element of Applicant's independent claim 1. For example, Nelson in view of Maoz fails to teach or suggest an internal antenna and display device mounted on separate circuit boards within a programmer housing. The Maoz disclosure fails to even mention a display, as acknowledged by the Office Action.⁵ Even assuming, *arguendo*, that FIG. 1 of Maoz illustrates a display, as proposed by the Office Action, Maoz fails to disclose or suggest that the antenna and display device are mounted on separate circuit boards.

The Office Action characterized the printed wire board 4 in Maoz as a circuit board on which a display is mounted.⁶ The Office Action, however, did not provide any support for the conclusion that the internal antenna 10 in Maoz is mounted on a circuit board other than the printed wire board 4. While Maoz states that "internal antenna 10 includes a [printed wire board] constituted of a dielectric substrate having an electrically-conductive layer 13 on one face, serving as the ground plane and cut with a radiant slot 14. . . , " it does not appear the printed wire board is a circuit board on which an internal antenna is mounted. Instead, Maoz discloses that the internal antenna 10 is mounted on the printed wire board 4, i.e., the "display" circuit board, as characterized by the Office Action. For example, Maoz discloses that an internal antenna 10 is electrically connected to printed wire board 4,⁷ and is carried by the printed wire board 4.⁸ Accordingly, Maoz does not disclose or suggest an internal antenna mounted on a first circuit board and a display device mounted on a second circuit board, as required by independent claim 1.

Even assuming the internal antenna 10 is mounted on a circuit board other than the printed wire board 4, which Applicant disagrees with, Maoz does not disclose or suggest that a ground plane of a circuit board on which the internal antenna 10 is mounted is interrupted by a plurality of gaps. The Office Action characterized the slots 53a and 53b in the conductive layer 51 of the Maoz printed wire board 4 as a plurality of gaps in a substantially contiguous ground

⁵ *Id.*

⁶ *Id.*

⁷ Maoz at para. [0010].

⁸ *Id.* at para. [0038].

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

plane layer.⁹ Applicant's claim 1 requires that the circuit board on which the antenna is mounted includes the plurality of gaps. In contrast, the slots 53a and 53b in Maoz are in a layer of the printed wire board 4¹⁰, i.e., the display circuit board, as characterized by the Office Action. Accordingly, the Nelson in view of Maoz fails to disclose or suggest that a circuit board on which an internal antenna is mounted includes a substantially contiguous ground plane layer interrupted by a plurality of gaps.

The Office Action failed to provide any motivation or apparent reason why a person of ordinary skill in the art would have modified the device of Nelson, which includes an external antenna, to include the internal antenna of Maoz. The Office Action merely concluded that "such a modification would provide the predictable result of a programmer with an internal antenna and a ground plane layer that is disrupted by gaps for providing increased power without internal noise."¹¹ The Office Action seems to have pulled the supposed reason to combine Nelson and Maoz out of Applicant's specification, which is impermissible.¹² The skilled person, without access to Applicant's disclosure, would not have appreciated the advantages of a programmer including a display and internal antenna mounted on separate circuit boards, as defined by Applicant's claim 1, much less a circuit board on which an internal antenna is mounted, where the circuit board includes a substantially contiguous ground plane layer interrupted by a plurality of gaps.

In particular, Nelson et al. and Maoz do not contemplate that such an arrangement can be effective in achieving a reduction in electrical and electromagnetic interference during telemetry sessions with a medical device using the internal antenna. This is especially true because Nelson et al. does not even disclose a medical device programmer with an internal antenna, and therefore has no regard for the interference problems posed by such an arrangement. Further, Maoz does not contemplate use of its antenna with a medical device programmer. It is unclear why one skilled in the art, looking to modify Nelson, which does not even disclose an internal antenna, would have looked to Maoz, which relates to mobile communication apparatuses, such as a

⁹ Office Action at p. 3, item 4.

¹⁰ Maoz at para. [0043].

¹¹ Office Action at p. 3, item 4.

¹² See *Interconnect Planning Corp. v. Feil*, 227 USPQ 543 (Fed. Cir. 1985); see also *In re Fine*, 5 USPQ.2d 1596, 1598 (Fed. Cir. 1988); see also *In re Gorman*, 18 USPQ.2d 1885, 1888 (Fed. Cir. 1991); see also *Al-Site Corp. v. VSI International, Inc.*, 50 USPQ.2d 1161, 1171 (Fed. Cir. 1999).

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

mobile telephone¹³, and does not even contemplate the application of its device to a medical device programmer.

Dependent claims 2-10 and 21

Claims 2-10 and 21 depend from claim 1 and, accordingly, are also allowable over the cited art for at least the reasons given above with respect to claim 1. Claims 2-10 and 21 also recite additional elements that are neither disclosed nor suggested by the cited references. Applicant addresses some of the dependent claims below for purposes of illustration.

The Office Action rejected claims 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 1 above, and further in view of Carbunaru. According to claim 5, the first circuit board of claim 1 includes an electrostatic discharge layer defining a peripheral conductive layer and a central aperture. In support of the rejection of claim 5, the Office Action asserted that Carbunaru discloses that printed circuit boards utilized in medical devices may contain electrostatic discharge layers built into them.¹⁴ The Office Action concluded that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the circuit board of Nelson in view of Maoz with a printed circuit board with a static discharge layer as taught by Carbunaru since it would have provided the device with a protection circuit to prevent circuit failure due to electrostatic discharge.¹⁵

Applicant respectfully disagrees with the Office Action's conclusion of obviousness. Carbunaru makes a single statement regarding electrostatic discharge circuits. Namely, at paragraph [0070], Carbunaru describes FIG. 3A and states, "[a]dditionally, the [printed circuit board] may contain electrostatic discharge (ESD) protection circuits 471, 472, 473, and 474 that are only active when electrostatic discharge is present." Carbunaru provides no further details regarding the construction or implementation of the electrostatic discharge circuits. For example, Carbunaru fails to disclose or suggest that the ESD circuit is an ESD layer defining a peripheral conductive layer and a central aperture, as required by Applicant's claim 5.

As suggested by Applicant's disclosure, a medical device programmer including a circuit board that includes an electrostatic discharge layer defining a peripheral conductive layer and a

¹³ Maoz et al. at paragraph [0001].

¹⁴ Office Action at pp. 4-5, item 10.

¹⁵ *Id.* at p. 5, item 10.

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

central aperture may provide advantages. For example, this arrangement may substantially reduce the electromagnetic load to the magnetic circuit of antenna.¹⁶ Carbunaru fails to consider or appreciate the advantages of this arrangement and provides no disclosure or suggestion that this arrangement is desirable. Carbunaru only shows its ESD circuits in FIG. 3A, which is a "schematic diagram representing the electrical circuitry of the chair pad."

Applicant further notes that the Office Action appears to have disregarded the limitations of claim 5 that require the electrostatic discharge layer to define a peripheral conductive layer and a central aperture. The Office Action has completely failed to demonstrate how the cited references disclose or suggest the claimed electrostatic discharge layer. Applicant respectfully requests that the Examiner address these arguments in the next communication.

It is unclear why one skilled in the art looking to modify the programmer of Nelson would have looked to a chair pad for charging an implantable stimulator described by Carbunaru to include ESD protection circuits. Carbunaru does not disclose or suggest that its ESD protection circuits may be used to prevent failure of a circuit board on which an internal antenna of a medical device programmer is mounted. In fact, Carbunaru does not contemplate application of its ESD protection circuits to a device other than the chair pad, much less a circuit board of a medical device programmer.

Claim 6 depends from claim 5 and specifies that the internal antenna of claim 1 defines an aperture, and that the central aperture of the ESD layer substantially approximates the size and shape of the aperture of the internal antenna. With respect to the rejection of claim 6, the Office Action found that "since the layers are throughout the entire circuit board then it would be obvious that the electrostatic discharge layer would be the approximate size and shape of the antenna."¹⁷ Applicant respectfully disagrees. Even if the ESD protection circuits in Carbunaru are "throughout the entire circuit board," as proposed by the Office Action, which Applicant disagrees with, the Office Action offers absolutely no support for the assertion that the ESD circuits define a central aperture or that the central aperture of the ESD circuits substantially approximates a size and shape of the antenna aperture, as required by claim 6. The cited references fail to disclose or suggest that an internal antenna of a medical device programmer has

¹⁶ See, e.g., Applicant's originally-filed disclosure at paragraph [0137].

¹⁷ Office Action at p. 5 at item 10.

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

substantially the same size and shape as a circuit board on which the antenna is mounted. In addition, Carbunaru does not contemplate application of its ESD protection circuits to a circuit board for an internal antenna. Thus, it is unclear how ESD layers that are "throughout the entire circuit board" would necessarily approximate the size and shape of the antenna, as suggested by the Office Action.

Claim 7 depends from claim 5 and further specifies that the electrostatic discharge layer is a first electrostatic discharge layer formed on a first side of the ground plane layer, and the programmer further comprises a second electrostatic discharge layer formed on second side of the ground plane layer. In support of the rejection of claim 7, the Office Action reasoned that "[i]t would have been an obvious matter of design choice" to modify the circuit board in Nelson in view of Maoz in further view of Carbunaru "with dual layers of electrostatic discharge, because Applicant has not disclosed that dual layers provides an advantage, is used for a particular purpose, or solve a stated problem."¹⁸ The Office Action also reasoned that "[o]ne of ordinary skill in the art . . . would have expected Applicant's invention to perform equally well with a single layer as taught by Nelson in view of Maoz in further view of Carbunaru."

If the Office Action is relying on an assertion of equivalence to support the obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on Applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. Applicant respectfully requests the Office Action to provide evidence to support the assertion of equivalence or withdraw the rejection of claim 7.

As the Office Action appears to have recognized, the cited art fails to teach or suggest a first electrostatic discharge layer formed on a first side of the ground plane layer, and a second electrostatic discharge layer formed on second side of the ground plane layer, as recited by claim 7. While the Office Action relies on "design choice" to support the rejection of claim 7, which Applicant disagrees with, the Office Action has failed to address how the prior art discloses or suggest an ESD layer on a ground plane layer. Nothing in the cited references even teaches or suggests placing an ESD layer on a ground plane layer.

¹⁸ *Id.*

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

For at least these reasons, the Office Action has failed to establish a *prima facie* case for non-patentability of Applicant's claims 1-10 and 21 under 35 U.S.C. § 103(a). Withdrawal of the rejection of claims 1-10 and 21 under 35 U.S.C. § 103(a) is respectfully requested.

Claims 23-32

Claim 23 is directed to a programmer for an implantable medical device. The programmer includes an internal antenna mounted on a first circuit board within a programmer housing, where the internal antenna has a loop-like structure and defines a first aperture, and the first circuit board includes at least one signal plane with an electrostatic discharge layer defining a second aperture in substantially overlapping alignment with the first aperture. The programmer further includes a display device mounted on a second circuit board within the programmer housing. Additionally, the first circuit board includes a substantially contiguous ground plane layer interrupted by a plurality of gaps.

For similar reasons described above with respect to claims 1 and 5, the cited references fail to teach or suggest each and every element of independent claim 23. Claims 24-32 depend from claim 23, and are in condition for allowance for at least the reasons described above with respect to claims 1 and 5. For at least these reasons, the Office Action has failed to establish a *prima facie* case for non-patentability of Applicant's claim 23-32 under 35 U.S.C. § 103(a). Withdrawal of this rejection is respectfully requested.

Application Number 10/693,011
Response to Office Action mailed October 15, 2007

RECEIVED
CENTRAL FAX CENTER
JAN 15 2008

New Claims

Applicant has added claims 33 and 34 to the pending application. The applied references fail to disclose or suggest the inventions defined by Applicant's new claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed inventions. As one example, the reference fail to disclose or suggest a programmer where the first circuit board and the second circuit board occupy different planes, displaced from one another, within the programmer housing, where the internal antenna is mounted on a first side of the first circuit board, and the display device is mounted on a second side of the second circuit board facing away from the first circuit board, as recited by claim 33. No new matter has been added by the new claims.

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

By:

January 15, 2008
SHUMAKER & SIEFFERT, P.A.
1625 Radio Drive, Suite 300
Woodbury, Minnesota 55125
Telephone: 651.735.1100
Facsimile: 651.735.1102

Jessica H. Kwak
Name: Jessica H. Kwak
Reg. No.: 58,975